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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/822,145

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EXAMINER

JAIN, RAJ K

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/822,145	Applicant(s) YANG ET AL.	
	Examiner RAJ JAIN	Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 8-10 and 18-20 are objected to because of the following informalities:
The subject claims are redundant as they recite features already in their respective independent claims. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim(s) 1, 2, 4, 8-10 and 5-7 is/are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory “process” under 35 U.S.C. 101 must (1) be tied to particular machine, or (2) transform underlying subject matter (such as an article or material) to a different state or thing. See page 10 of In Re Bilski 88 USPQ2d 1385. The instant claims are neither positively tied to a particular machine that accomplishes the claimed method steps nor transform underlying subject matter, and therefore do not qualify as a statutory process.

The elements of Claim(s) 1 and 5 of “classifying and counting....” are broad enough that the claim could be completely performed mentally, verbally or without a machine nor is any transformation apparent and further

1) do not tie to another statutory class (such as a particular apparatus) by identifying the apparatus that accomplishes the method steps.

2) do not have a structure required by the claim, or positively recited in the body of the claim in association with a step significant to the inventive concept.

A claim reciting an adequate structural tie must positively recite the structure of another statutory category in association with a step significant to the inventive concept. The following are examples of structural recitations **that do not constitute** adequate structural ties per se: (1) Structure recited in a preamble alone, (2) structure in a phrase

expressing intended use or purpose, and (3) structure in a step insignificant to the inventive concept, such as nominal pre or post solution activity.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3, 5, 11 and 13-16 recites the limitation "the previous packet" in appropriate lines as it first appears in the claims. There is insufficient antecedent basis for this limitation in the claim.

Claims 3, 14 and 15 further recite in appropriate lines "when the quantity" this phrase does not limit the scope of the claim, recommend rewording the claim as appropriate.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,2, 5 and 7-10 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Shao et al (US 2004/0170186 A1).

Regarding claim(s) 1, Shao discloses a packet scheduling method (see abstract, Fig. 1) comprising: (a) classifying a stream according to at least one of a data rate and a length of a packet (Fig.1 incoming traffic streams are fed to classifier 120 and are separated according to specific types; paras 40, 43, 44); (b) if the packet of the classified stream is a first packet, storing the packet in a first stream queue, and if the packet of the classified stream is a subsequent packet, storing the packet in a second

stream queue (packets are stored based on their classification paras 44, different packets are queued using different MCS levels); (c) counting a virtual start service time of the packet stored in the first stream queue according to a weighted fairness queuing method (Fig. 2, ref. 220 abstract, Para 29, virtual start time is determined for a packet); and (d) counting a virtual start service time of the packet stored in the second stream queue as a virtual finish service time of the previous packet (Paras 60 the virtual start time of next queued packet in second stream is same as virtual finish time of previous packet in the previous queue, see also equation in para 83 having a relation of the virtual start time with the virtual finish time).

Further with respect to claim 5, Shao discloses detecting a legal packet whose virtual start service time is shorter than a system virtual service time by scanning the virtual start service time of the packets stored in the first stream queue and the second stream queue (paras 79-83, the equation in para 83 defines a virtual start service time in relation to the virtual finish time which is derived based on the total delay of the packet from equation in para 81).

Regarding claim(s) 2, Shao discloses WF2Q or WF2Q+ algorithm (paras 44 and 93, while Shao only discloses WFQ, it is well know in the arts the WF2Q algorithms and its implementation which are similar to WFQ).

Regarding claim(s) 7, Shao discloses transmitting legal packet to next node (Figs. 1-2, with nodes as UE in Fig. 1)

Regarding claim(s) 8, Shao discloses the first stream queue of step (b) is classified according to a data rate of the stream (paras 40-44).

Regarding claim(s) 9, Shao discloses the first stream queue of step Co) is classified according to a length of the packet of the stream (paras 40-44).

Regarding claim(s) 10, Shao discloses the first stream queue of step (b) is classified according to a data rate of the stream and a length of the packet (paras 40-44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shao et al (US 2004/0170186 A1) in view of Chao et al (US 6,389,031 A1).

Shao discloses a packet scheduling method (see abstract, Fig. 1) comprising: (a) classifying a stream according to at least one of a data rate and a length of a packet (Fig.1 incoming traffic streams are fed to classifier 120 and are separated according to specific types; paras 40, 43, 44); (b) if the packet of the classified stream is a first packet, storing the packet in a first stream queue, and if the packet of the classified stream is a subsequent packet, storing the packet in a second stream queue (packets are stored based on their classification paras 44, different packets are queued using different MCS levels); (c) counting a virtual start service time of the packet stored in the first stream queue according to a weighted fairness queuing method (Fig. 2, ref. 220 abstract, Para 29, virtual start time is determined for a packet); and (d) counting a virtual start service time of the packet stored in the second stream queue as a virtual finish service time of the previous packet (Para 60 the virtual start time of next queued packet in second stream is same as virtual finish time of previous packet in the previous queue); wherein step (c) is performed in accordance with WF2Q or WF2Q+ algorithm (paras 44 and 93, while Shao only discloses WFQ, it is well known in the arts the WF2Q algorithms and its implementation which are similar to WFQ).

Shao fails to disclose use performing step (c) with equation zero: $S_i^k = \max(V(a_i^k), F_i^{k-1})$.

Chao discloses $S_i^k = \max(V(a_i^k), F_i^{k-1})$ (col 13 lines 55-65; col 34 lines 35-45). The subject equation approximates processor sharing by determining virtual time, which records the rate of service seen by a packet at the head of a queue. Thus the foregoing equation can be used to determine a packet's virtual finishing time the moment it arrives at a queue. Thus it would have been obvious at the time the invention

was made to incorporate the teachings of Chao within Shao so as to determine a packets virtual finishing time the moment it arrives at a queue.

Regarding claim(s) 6, Shao fails to disclose a virtual finish service time in accordance with equation $F_i^k = S_i^k + (L_i^k / R_i^{(t)})$.

Chao discloses a virtual finish service time in accordance with equation $F_i^k = S_i^k + (L_i^k / R_i^{(t)})$, (col 34 lines 35-45).

The subject equation approximates processor sharing by determining virtual time, which records the rate of service seen by a packet at the head of a queue. Thus the foregoing equation can be used to determine a packets virtual finishing time the moment it arrives at a queue. Thus it would have been obvious at the time the invention was made to incorporate the teachings of Chao within Shao so as to determine a packets virtual finishing time the moment it arrives at a queue.

Claims 4, 11, 15, 16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shao et al (US 2004/0170186 A1) in view of Chiussi et al (USP 6,693,913 B1).

Shao discloses a packet scheduling method and apparatus (see abstract, Fig. 1) comprising: (a) classifying a stream according to at least one of a data rate and a length of a packet (Fig.1 incoming traffic streams are fed to classifier 120 and are separated according to specific types; paras 40, 43, 44); (b) if the packet of the classified stream is a first packet, storing the packet in a first stream queue, and if the packet of the classified stream is a subsequent packet, storing the packet in a second stream queue (packets are stored based on their classification paras 44, different packets are queued using different MCS levels);

Shao fails to disclose a SEFF strategy.

Chiussi discloses a SEFF strategy (col 3 lines 39-64, col 4 lines 16-27). Seff selector allows packet selection based on a minimum service timestamp among sessions and thus reducing backlogged flows.

Thus it would have been obvious at the time the invention was made to incorporate the teachings of Chiussi within Shao so as to maintain proper session flow amongst backlogged queues.

Further with respect to claim 15, Shao discloses a relationship with the virtual start time and virtual finish time in accordance with equation $S_i^k = F_i^{k-1}$ (para 83).

Regarding claim(s) 18, Shao discloses the first stream queue of step (b) is classified according to a data rate of the stream (paras 40-44).

Regarding claim(s) 19, Shao discloses the first stream queue of step Co) is classified according to a length of the packet of the stream (paras 40-44).

Regarding claim(s) 20, Shao discloses the first stream queue of step (b) is classified according to a data rate of the stream and a length of the packet (paras 40-44).

Claims 13, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shao et al (US 2004/0170186 A1) in view of Chiussi et al (USP 6,693,913 B1) and further in view of Chao et al (US 6,389,031 A1).

Shao discloses a packet scheduling method and apparatus (see abstract, Fig. 1) comprising: (a) classifying a stream according to at least one of a data rate and a length of a packet (Fig.1 incoming traffic streams are fed to classifier 120 and are separated according to specific types; paras 40, 43, 44); (b) if the packet of the classified stream is a first packet, storing the packet in a first stream queue, and if the packet of the classified stream is a subsequent packet, storing the packet in a second stream queue (packets are stored based on their classification paras 44, different packets are queued using different MCS levels);

Shao fails to disclose a SEFF strategy.

Chiussi discloses a SEFF strategy (col 3 lines 39-64, col 4 lines 16-27). Seff selector allows packet selection based on a minimum service timestamp among sessions and thus reducing backlogged flows.

Thus it would have been obvious at the time the invention was made to incorporate the teachings of Chiussi within Shao so as to maintain proper session flow amongst backlogged queues.

Shao and Chiussi fail to disclose virtual time function based on equation $V(t+t) - \max(V(t) + t, \min_{i \in B(t)} S_i^{hi(t)})$ and/or the equation $S_i^k = \max(V(a_i^k), F_i^{k-1})$.

Chao discloses virtual time function based on equation $V(t+t) - \max(V(t) + t, \min_{i \in B(t)} S_i^{hi(t)})$, and/or the equation $S_i^k = \max(V(a_i^k), F_i^{k-1})$. (col 34 lines 35-67).

The subject equation approximates processor sharing by determining virtual time, which records the rate of service seen by a packet at the head of a queue. Thus the foregoing equation can be used to determine a packets virtual finishing time the moment it arrives at a queue. Thus it would have been obvious at the time the invention was made to incorporate the teachings of Chao within Shao so as to determine a packets virtual finishing time the moment it arrives at a queue.

Further with respect to claim 17, Chao discloses a virtual finish service time in accordance with equation $F_i^k = S_i^k + (L_i^k / R_i^{(t)})$, (col 34 lines 35-45). Reasons for combining same as above.

Response to Arguments

Applicant's arguments filed January 23, 2009 have been fully considered but they are not persuasive. Applicant's arguments with respect to claims 1-11 and 13-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RAJ JAIN whose telephone number is (571)272-3145. The examiner can normally be reached on M-TH.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Raj K. Jain/

Examiner, Art Unit 2416